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Comparing a Modified Dry By-product to Dry Distillers Grains with Solubles in Growing Calf Diets

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Summary

A growing trial was conducted to contrast a new by-product, Dakota Bran Cake (DBRAN), against dry distillers grains with solubles (DDGS) and evaluate the two by-products at two dietary inclusion levels on steer calf performance measurements. Diet treatments included 15% DBRAN, 30% DBRAN, 15% DDGS, and 30% DDGS, replacing a blend (70:30 ratio) of brome grass hay and alfalfa haylage (DM basis). Final BW, ADG, and DMI increased, while F:G decreased as the inclusion level for both of these by-products increased from 15 to 30% DM. DDGS significantly improved ADG and F:G compared to feeding DBRAN at both inclusion levels. Feeding DBRAN and DDGS in growing diets to steer calves improved performance at higher dietary inclusion levels, while DDGS tended to improve performance over DBRAN.

Introduction

Generally, by-products have lower starch levels compared to corn, but with equal or improved energetic gain responses in cattle. One modified dry by-product being produced now is Dakota Bran Cake (DBRAN). This product has comparable energy and lower protein content than dry distillers grains with solubles (DDGS). A previous feedlot study was conducted and found DBRAN fed wet had similar feeding performance to DDGS and 100-108% the energy value of corn (*2006 Nebraska Beef Report*, pp. 57-58). The objectives of this trial were to contrast the feeding value of DBRAN against DDGS and evaluate these by-products at two dietary inclusion levels in high roughage, growing diets for steer calves.

Procedure

An 82-day growing trial used 256 crossbred backgrounded steer calves (620 ± 51.1 lb) in a randomized complete block design experiment. Steers were weighed on two consecutive days (day 0 and day 1) to obtain an initial BW after a five-day limit feeding period of a 50% ground alfalfa hay and 50% wet corn gluten feed diet at 2.0% of BW. The weights obtained from day 0 were used to block the steers into 3 weight blocks, stratify by weight within block, and assign randomly to pens. Pens were then assigned randomly within block to one of four dietary treatments with four pens per treatment and 16 steers per pen.

Dietary treatments (Table 1) consisted of 15% DBRAN (15DBRAN), 30% DBRAN (30DBRAN), 15% DDGS (15DDGS), and 30% DDGS (30DDGS) on DM basis. Inclusion of by-products in the diets replaced 70:30 (DM basis) ground brome grass hay to alfalfa haylage. All diets contained 2% dry supplement (DM basis) and were formulated to contain 200 mg/ steer daily Rumensin® (*Elanco Animal Health, Greenfield, Ind.*). Diets were formulated to meet or

Table 1. Composition of dietary treatments for cattle fed 2 levels of 2 by-product types (%DM)[a].

Ingredient	15DBRAN	30DBRAN	15DDGS	30DDGS
Brome Grass Hay	58.1	47.6	58.1	47.6
Alfalfa Haylage	24.9	20.4	24.9	20.4
Dakota Bran Cake, pelleted	15	30	—	—
Dry Distillers Grains	—	—	15	30
Dry Supplement[b]	2	2	2	2
Ingredient Analysis	DBRAN	DDGS	BH	AH
DM	92.0	90.5	90.0	35.0
Starch	23.2	7.7		
NDF	30.3	29.2	72.5	39.7
CP	15.5	30.4	10.9	23.4
Ether Extract	10.8	11.2		
IVDMD	81.1	80.5	50.6	68.4

[a]15DBRAN = 15% DBRAN, 30DBRAN = 30% DBRAN, 15DDGS = 15%DDGS, 30DDGS = 30% DDGS, DBRAN = Dakota Bran Cake, DDGS = dry distillers grains with solubles, BH = brome grass hay, AH = alfalfa haylage.
[b]Formulated to provide 200 mg/ steer daily Rumensin-80®.

Table 2. Performance measurements for cattle fed 2 levels of 2 by-product types [ab].

	Level			Type			
Parameter	15	30	*P*-value	DBRAN	DDGS	*P*-value	Inter
Initial BW, lb	621	619	0.23	621	619	0.30	0.80
Final BW, lb	797	825	<0.01	806	816	0.06	0.33
DMI, lb	18.9	19.6	0.01	19.3	19.2	0.77	0.63
ADG, lb	2.15	2.51	<0.01	2.26	2.40	0.05	0.35
F:G	8.82	7.81	<0.01	8.54	8.04	0.01	0.19

[a]15DBRAN = 15% DBRAN, 30DBRAN = 30% DBRAN, 15DDGS = 15% DDGS, 30DDGS = 30% DDGS.
[b]Level = Main effects of by-product inclusion level; Type = main effects of by-product type; Inter = interaction of by-product level and type.

exceed NRC (1996) requirements for metabolizable protein, degradable intake protein, Ca, and P. DBRAN (Tall Corn Ethanol, Coon Rapids, Iowa) was dried from its modified wet form and then pelleted for feeding purposes in this trial.

Steers were fed their respective treatment diets ad libitum twice daily at 0700 and 1200 hours. They were then limit fed the same common diet as was fed at the beginning of the trial for 6 days at 2.0% of BW then weighed on two consecutive days to obtain a similar fill weight at the end of the 82 d treatment feeding period compared to that at the beginning of the trial.

Feed samples were collected weekly, analyzed for DM at 60°C for 48 hours. Data were analyzed using the mixed procedures of SAS as a randomized complete block design, with pen as the experimental unit.

Results

Feeding DBRAN and DDGS at 15 and 30% DM did not result in any significant interactions between by-product type or inclusion level (Table 2). Higher inclusion levels of both by-products resulted in greater ($P<0.01$) final BW and ADG. DBRAN and DDGS at 30% of diet DM also increased ($P= 0.01$) DMI and improved ($P<0.01$) F:G compared to feeding these by-products at 15% DM. Furthermore, feeding DDGS tended ($P= 0.06$) to increase final BW and significantly ($P<0.05$) increased ADG compared to feeding DBRAN. Although DMI was not affected ($P= 0.77$) by by-product type, F:G was significantly ($P<0.01$) improved for feeding DDGS compared to DBRAN.

Feeding DBRAN and DDGS in high roughage, growing steer diets improved weight gains and feed conversions at higher inclusion levels. DDGS tended to be a slightly superior by-product for feeding values compared to DBRAN with growing steers. As these diets were formulated to meet protein requirements, we estimate DBRAN had 84% the energy value of DDGS likely due to higher fat content in DDGS. Previous research has shown that DDGS has about 125% the energy value of corn in forage based diets. Therefore, DBRAN appears to have an energy value equal to or 3% higher than corn.

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